

Abstract of the Invention

A homogenous charge compression ignition barrel engine includes an engine housing with a first and second end. An elongated power shaft is longitudinally disposed in the engine housing and defines a longitudinal axis of the engine. A plurality of cylinders surround the longitudinal axis with each cylinder having a closed end and an open end. Each cylinder has a central axis. The open ends of the cylinders are each generally directed toward the first end of the housing. An intake system is operable to introduce a combustible mixture of air and fuel into each of the cylinders. A track is disposed between the first end of the housing and the open ends of the cylinders such that a portion of the track is disposed generally in alignment with the central axis of each of the cylinders. The track has a cam surface that longitudinally undulates with respect to the open ends of the cylinders. A portion of the cam surface is disposed generally in alignment with the central axis of each of the cylinders. The track and the cylinders are rotatable with respect to each other such that the undulating cam surface moves with respect to the open ends of the cylinders. A piston is moveably disposed in each of the cylinders such that a combustion chamber is defined between the piston and the closed end of the cylinder. Each piston is in mechanical communication with the cam surface of the track such that as the cylinders and the track move with respect to each other, the pistons reciprocate within the cylinders. Each cylinder is operable to compress a combustible mixture until the mixture auto ignites, without the introduction of a spark.